



FLOORING

Introduction

Wood– Hardwood flooring has gained tremendous popularity recently due to its high durability and ease of maintenance. Wood floors can be refinished several times, offer warmth, character, and rich, natural beauty that complements any style and increase a home’s resale value. There are limitless choices in species, colors and patterns to choose. In addition, engineered wood flooring has made a huge impact on the marketplace due to its low cost and ease of installation.

Bamboo– Bamboo offers the same benefits as wood, although botanically, bamboo is not a wood. Bamboo is a grass and like grass it has a short growth cycle of approximately five years depending on the variety. As a result, bamboo is considered a rapidly renewable and sustainable product that saves our old-growth forests. Bamboo is harder than red oak, long lasting and naturally beautiful.

Linoleum– Natural linoleum flooring is manufactured from renewable natural raw materials (cork, wood flour, linseed oil, pine rosin, jute, and limestone), and is durable, easy to maintain, and attractive in appearance with a vibrant color palette. Linoleum is also hygienic, naturally anti-static, has excellent resistance to indentation marks and doesn’t melt like vinyl.

Cork– Cork is a natural product that is sustainably harvested from the bark of the cork oak tree. The outer casing of the tree can be harvested every nine years without harm to the trees that are known to live well over a hundred years. The unique cellular structure of cork gives this flooring excellent impermeability, resilience, thermal insulation, sound absorbency, fire retardation, and distinctive, natural appearance.

Concrete– Concrete flooring is inexpensive, durable, easy to take care of, and tremendously versatile. Concrete has a natural appeal that can be enhanced by staining, scoring, or texturing it. Finishes can resemble tile, slate, brick, or emit the look, texture, and feel of quarried stone like marble.

Tile– Ceramic tile is a beautiful inert material used for durable finishes. While it is energy intensive to produce, the environmental impacts are offset by

ceramic tile’s longevity. Ceramic tiles are available in a wide variety of colors, sizes and textures and require minimal maintenance. Recycled-content ceramic tiles are friendlier to the environment by using up to 100% waste glass, and are often more durable and moisture and stain resistant.

Wool– Wool carpet has excellent durability and notable natural safety features. Due to its high moisture and nitrogen content, wool is naturally flame resistant; it is difficult to ignite and has low flame spread and heat release properties. Moisture content also reduces static electricity. Wool carpet is non-toxic, non-allergenic and deters bacterial growth.

Natural Grasses– Woven mats and rolls of natural grasses such as sisal, seagrass, jute, and coir offer durable, low-maintenance, natural and non-toxic flooring alternatives. Moisture content also reduces static electricity.

Carpet– Carpet is typically the last choice on the list of green flooring alternatives, but carpeting still has a strong marketplace presence due its positive aspects of sound reduction and low cost. The carpet industry, though, in recent years has made great strides to improve green options in their products. Greener features to look for in carpeting are products made with up to 100% recycled fibers made from your recycled soda bottles. Shorter napped carpet will be easier to clean and hold less dirt, dust and allergens. One major manufacturer also sells carpet tiles that can be easily cleaned and replaced and one of their products is made from corn silk. Lastly, look for carpet that is certified under the Carpet and Rug Institute’s “Green Label” indicating products with lower harmful volatile organic compound (VOC) emissions.

Green Building Benefits

Indoor Air Quality

In recent years, conventional flooring such as carpet and vinyl, have become controversial due to the potential for chemical offgassing, the pollution created during manufacture, the amount of old carpet filling up our landfills, the difficulty in maintenance and cleaning, and for creating a habitat for mold, dust, bacteria and other allergy-causing organisms to flourish. As more is learned about the personal health and environmental hazards of carpet and vinyl in

their production, use, and disposal, green flooring alternatives, are becoming popular.

Carpet due to the “sink effect” can absorb substances tracked in from walking across the floor with shoes that have been exposed to the numerous chemicals in daily life such as road oil, anti-freeze, dirt, pesticides and herbicides. Outdoors, ultraviolet sunlight breaks down some of these chemicals, but in the carpet there is nothing to remove them. The VOCs emitted from vinyl flooring or the adhesives used during carpet installation, are also regarded health threats.

To improve indoor air quality, consider reducing the amount of carpeting or vinyl in your home. Greener material options include wood, bamboo, linoleum, cork, concrete, ceramic tile, wool, and natural grasses. Using throw rugs or area rugs on hard floor surfaces allows you to gain the aesthetic benefits of carpet without the air quality implications.

Resource Conservation

Materials like bamboo, cork, wool, and grasses that can be harvested in as little as one to nine years of growth are considered a rapidly renewable resource, with significant environmental advantages over finite raw material or long-cycle renewable resource extraction such as with wood or petroleum. The raw materials needed to make natural linoleum are minimally processed and commonly available. Because of its ingredients, linoleum is also considered a rapidly renewable and abundant natural resource. Due to their durability, green flooring materials have a longer use phase than carpet or vinyl, reducing the amount of material that needs to be produced and landfilled.

Conventional carpet is made from a variety of chemicals derived from petroleum, a non-renewable resource, and poses significant environmental hazards due to air and water pollution from the manufacturing process. Carpet and vinyl also pose a significant environmental burden, because they have a fairly short lifespan, are not typically recycled, and are quickly dumped into a landfill where they take up significant space compared to other wastes.

Affordability

The higher initial cost for most green flooring options deserves a second look when compared to conventional carpet and vinyl tiles. When durability, ease of maintenance, and long life span are considered, green flooring proves to be more economical. A quick comparison between carpeting

and hardwood floors shows that carpeting lasts between seven and ten years while hardwood floors easily last 30 or more years. During a 30-year period carpeting needs to be installed four or five times. At that rate, hardwood flooring actually costs significantly less than the cumulative cost of all the carpeting installed.

Green vs. Conventional

Wood Flooring	Carpeting
Durable (30+ yr lifespan)	Less durable (7-10 yr lifespan)
Hard surface does not hold particulates	Fibers act as “sink” for dirt and odors
Low/No emissions depending on finish	Fibers and backing offgas VOCs
Refinishable and reusable	Must be landfilled. Few options for recycling.
Made of renewable resources	Made of non-renewable resources
Installed cost: higher first costs – cheaper over its lifetime	Installed cost: lower first cost – short life span
O&M cost: lower	O&M cost: higher
Bamboo Flooring	Hardwood Flooring
Fiber matures in 4-7 yrs	Matures in 40-120 years
Reduces the need for virgin forest lumber	Typically come from old-growth forests
Hardness ranges from that of red oak to hard maple	Hardness ranges from soft to very hard depending on species/age
Installed cost and maintenance are similar	Installed cost and maintenance are similar
Finished Concrete	Conventional Covering
Uses existing foundation	Requires a covering
Durable and moisture and stain resistant	Requires maintenance
Staining/sealing and O&M cost is low.	Installation and O&M cost is higher.

Green vs. Conventional

Linoleum or Cork	Vinyl Flooring
Made of natural materials	Made of synthetic materials
Low offgassing from natural oils	High offgassing from petroleum distillates
Renewable and biodegradable	Production and incineration creates dioxin
Naturally anti-static, doesn't melt	No such properties
Installed cost: comparable to high-end vinyl, but lasts 30+ years	Installed cost: lower than linoleum but shorter life span
O&M cost: lower than vinyl due to inherent durability and no need for sealers or waxes	O&M cost: considerably higher than linoleum, needs frequent waxing to maintain appearance
Recycled-Content Ceramic Tiles	Conventional Ceramic Tiles
Reuses a waste material	Uses virgin materials
Durable and moisture and stain resistant	Durable and moisture and stain resistant
Installation and O&M cost is the same. Material cost varies with manufacturers.	Installation and O&M cost is the same. Material cost varies with manufacturers.
Green Carpeting	Conventional Carpeting
Made of recycled synthetic materials	Made of synthetic materials
CRI Green-labeled for lower VOC emissions.	Fibers and backing offgas VOCs
Uses no-VOC adhesive	Uses high-VOC adhesive
Tiles reduce amount of carpet replaced in O&M	Rolls require complete replacement in O&M
Short nap holds fewer particulates	High nap holds more particulates

Wool or Natural Grasses	Carpeting
Made of natural materials	Made of synthetic materials
No offgassing	Fibers and backing offgas VOCs
Renewable and biodegradable	Production and incineration creates dioxin
Naturally anti-static, doesn't melt	No such properties
Installed cost: comparable to high-end carpet, but lasts 30+ years	Installed cost: lower to similar to green options
O&M cost is comparable	O&M cost is comparable

Installation

Bamboo is typically factory pre-finished (although it can be site-finished in similar fashion to hardwood. On-site finishing gives opportunity for emitting more VOCs into the home.

Cork and linoleum sheets/tiles should be installed by an experienced professional. It is very important that the cork or linoleum acclimate to the room for at least one week prior to installation. A no-VOC, water-based adhesive should be used to glue the tiles/sheets to the subfloor.

A finished concrete floor must be finished with care to get a slick finish during “the pour” and then be well protected/covered during construction to avoid stains and scratches in the final product. Scoring, staining and sealing can be done at the beginning of construction or near the end. The installation should be done by a professional, but can be successfully done by a thoughtful tradesperson or homeowner with some training.

Recycled tile is installed in the same fashion as conventional tile.

Wool and natural grasses are installed with tack strips or other physical attachments at the edges as with conventional carpet. Adhesives are typically not used.

Green carpet is installed in the same fashion as conventional carpet except that green carpet uses no-

VOC adhesives (as opposed to high VOC adhesives) or no adhesives in the case of tiles (which stay in place on friction of the rubber backing).

All flooring options (except carpet and vinyl) should be acclimated outside of the packaging in the room for a week before installation to get the humidity and temperature to equalize in the material. No flooring material should be installed in basements or other locations where there is potential for moisture to rise up from the concrete subfloor.

Operation and Maintenance

All hard-surface flooring requires the least amount of maintenance (simple sweeping and occasional mopping with mild detergents) and is usually very stain resistant.

Bamboo flooring can be sanded and refinished like any other solid wood flooring. Cork and linoleum have a tremendous amount of “memory,” recover well from compression and can last as long as most hardwood floors. If the flooring gets scratched, simply buff the spot and re-apply a light coat of water-based polyurethane.

Ceramic tiles offer a very hard, scratch-resistant surface requiring minimal maintenance. Tiles with integral color disguise chips that occur during use.

Concrete flooring is probably the easiest to take care of with normal sweeping and mopping with a mild soap and water. Moisture and water will not damage concrete and concrete flooring is always easy to cover if tastes change.

Carpet and vinyl have the largest expenses for maintenance with vacuuming and shampooing required for carpet and rewaxing required for vinyl.

Bay Area Suppliers

Flooring materials are available from a vast array of retailers and wholesalers throughout the region and on the internet. Make sure to carefully research materials and trained/experienced installers. Problems with flooring come almost exclusively from problems with low quality installation.

- Search the **Materials Database** from Bay Area Build It Green to find local suppliers and services: (www.build-green.org)

For More Information

- **Building Green:** (www.buildinggreen.com) An independent company committed to providing accurate and unbiased information designed to improve the environmental performance, and reduce the adverse impacts of buildings. Publishers of Environmental Building News.
- **Green Resource Center:** is a Green Building information clearinghouse for the San Francisco Bay Area. (www.greenresourcecenter.org)
- **Green Seal** has a good fact sheet on carpets (www.greenseal.org/cgrs/Carpet_CGR.pdf)
- For more information about Green Building, visit our website at: www.greenaffordablehousing.org or call Bruce Mast at 510-271-4785.

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